ABSTRACT OF THE DISCLOSURE

The present invention is a technique and apparatus for providing preferential enhancement of an artery of interest relative to adjacent veins and background tissue by correlating the collection of a predetermined portion of data of a magnetic resonance contrast image during the arterial phase of the magnetic resonance contrast enhancement. The arterial phase of the contrast enhancement may be described as a period of a maximum, substantially elevated, or elevated contrast concentration in the artery of interest relative to adjacent veins.

The present invention includes a detection system for monitoring and detecting the arrival of the contrast agent in the artery and tissues of interest. When the concentration of contrast agent in the artery of the region of interest is maximum, substantially elevated or elevated (e.g., about 20-50% greater than the response of the region of interest to a series of magnetic resonance pulses before administration of a magnetic resonance contrast agent), a predetermined portion of the magnetic resonance image data (e.g., data which is representative of the center of k-space) may be acquired. Thus, the present invention facilitates synchronization between collecting the central portion of k-space image data with the

arterial phase of contrast enhancement. The center of k-space corresponds to the lowest spatial frequency data which dominates image contrast.